with minimal contamination of the peritoneal cavity that do not require resection. At present we feel the six hour "golden" period should be observed and that primary closure is certainly questionable after that time. In addition, antibiotics should be administered immediately after injury, during operation and postoperatively to reduce morbidity and mortality. Extraperitoneal rectal wounds still require a proximal diverting colostomy and appropriate drainage. Other factors arguing against primary closure are the presence of multiple associated injuries and a poor-risk patient in whom the operation would be prolonged by primary closure. When the above criteria cannot be met, the colon should be closed and exteriorized over a glass rod if possible. This is preferable to colostomy. If an uncomplicated course ensues, the colon can be returned to the abdomen in 10 to 14 days.

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Marginal Ulcer

MARGINAL ULCERS occur in 3 to 10 percent of patients in whom operations are done for duodenal ulcer. The ulcer recurrence rate after specific operations is widely variable: 34 percent after simple gastroenterostomy, 2.5 to 25 percent after vagotomy and pyloroplasty, 0.5 to 15 percent after gastric resection, and 0 to 1.8 percent following vagotomy and gastric resection. Most ulcers occur within two years of the initial procedure although the interval may be longer following gastroenterostomy.

Incomplete vagotomy is the most common cause of marginal ulcer, but other important etiological factors include retained antral mucosa following Billroth II gastric resection, unrecognized hyperparathyroidism and hypergastrinemia (Zollinger-Ellison syndrome). Clinical features of a marginal ulcer include pain (especially when located in the left upper quadrant), occult bleeding and sudden weight loss. Diagnostic tests should include endoscopy, barium upper gastrointestinal series, determination of basal acid secretion and serum calcium and gastrin determinations. A technetium scan may be useful if retained antral mucosa is suspected.

Surgical treatment of marginal ulcers is recommended and consists of completing the vagotomy and resecting the distal portion of the stomach if that has not been done previously. If hyperparathyroidism is present, it should be treated before further gastric procedures because parathyroidectomy alone may cure the marginal ulcer. A total gastrectomy should be done if hypergastrinemia is present because it is the most effective treatment for Zollinger-Ellison syndrome.

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Diagnosis of Venous Thrombosis—A 1976 Update

ALTHOUGH NEWER and noninvasive methods for venous thrombosis detection are available, radiographic phlebography is still the standard procedure for definitive diagnosis of clinically significant venous thrombosis. Indications for other procedures derive from contraindications to and impracticality of radiographic phlebography.

Noninvasive methods, including Doppler ultrasound flow detection, electric impedance and strain gauge plethysmography are adequate for detection of complete obstruction of the femoral and popliteal veins. Detection of nonobstructive, mural thrombi is less reliable, and thrombosis limited to the calf veins may not be detected with these procedures. Noninvasive thrombosis detection may be used in pregnant patients, patients with allergy to contrast media and those refusing invasive procedures.

Radionuclide angiography requires intravenous isotope injection distal to the thrombosis site. It shows the anatomy of the venous system but the quality of images is in general inferior to those of radiographic phlebography. Therefore, indications for its use are limited to patients with contraindications to phlebography. Venous scan with large radiolabeled particles (^{99m}Tc albumin aggregated) is based on Anger Camera imaging and subsequent polaroid photography of images produced by labeled particle entrapment on clots after distal intravenous radionuclide particle injection. Leg veins, iliac veins, inferior vena cava